

IP Protection Grades

acc. to EN 60 529

The grade of protection indicates the suitability of electrical components for various environmental conditions. Different grades of suitability are classified into so-called **IP codes**. IP stands for International Protection.

The IP protection grades define the grade of protection that the case provides against contact, foreign solid objects, and water.

The protection rating is always indicated by the letters IP followed by two digits. The **first digit** indicates the degree of protection that the case provides against contact and solid foreign objects. The **second digit** indicates the degree of protection that the case provides against liquids and water respectively.

First Digit	Protection against solid foreign objects	Protection against body contact
0	No protection	No protection
1	Large solid foreign objects (diameter 50 mm and greater)	Protected against large parts of the body (diameter 50 mm)
2	Medium-size solid foreign objects (diameter 12 mm and greater)	Finger protection (diameter 12 mm)
3	Small solid foreign objects (diameter 2.5 mm and greater)	Tools and wires (diameter 2.5 mm and greater)
4	Granular solid foreign objects (diameter 1 mm and greater)	Tools, wire, and small wires (diameter 1 mm and greater)
5	Dust protection; dust deposits tolerable, but total amount must not be harmful to the device's function	Full protection
6	No ingress of dust	Full protection

Second Digit	Protection against liquids
0	No protection
1	Protected against vertically falling drops of water
2	Protected against direct sprays of water up to 15° from the vertical
3	Protected against direct sprays of water up to 60° from the vertical
4	Protected against water sprayed from all directions, limited ingress permitted
5	Protected against low pressure jets of water from all directions
6	Protected against heavy seas or powerful water jets (flooding)
7	Protected against the effects of temporary immersion in water
8	Protected against the effects of continuous immersion in water



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Examples:

- Indoor wall clocks with protection grade **IP 54** (range of application e.g. indoor swimming pools) have movements protected against 5 harmful amounts of dust deposits 4 water sprayed from all directions.
- A DCF77 radio receiving aerial with protection grade **IP 68** for mounting outdoors is 6 dust proof 8 waterproof (protection against immersion).